

# Misunderstanding science?

The public reconstruction of science and technology

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# Introduction

ALAN IRWIN AND BRIAN WYNNE

One of the most routine observations about modern life concerns the rapid pace of technical change and the consequences of this for every aspect of society. Of course, this is not just a phenomenon of the 1990s. The social impact of ceaselessly changing science and technology has been a classical theme of writers, social scientists and scientists since the Industrial Revolution. Generally, the tone has been deterministic, suggesting that science and technology have their own objective logic to which society must adapt as best it can.

However, the relationship between scientific expertise and the 'general public' is currently a matter of renewed attention and social concern. Although the dominant form of this renewed interest is shaped by anxieties about the 'social assimilation' of science and technology (i.e. by a concern that the public are insufficiently receptive to science and technology), we will argue that this conceals a more fundamental issue regarding the public identity and organisation of science within contemporary society.

This edited collection focuses on one important aspect of this wider theme; the contemporary issue of what has become known as the 'public understanding of science'. As the following chapters demonstrate, this has become something of a fulcrum for debates over the social negotiation of power and social order in relation to science and technology. In this Introduction, we will first set the scene for the detailed analyses which follow and then explain the particular approach to this debate which has been adopted here. As this book demonstrates, concern with 'public understanding' takes us into many areas of case-study and socio-technical inquiry – it is thus all the more important to establish from the outset the major interlinkages and connections.

The main themes of this book can best be introduced through some specific instances. Certainly, and as the chapters of this book will argue, the often-problematic relationship between 'expert knowledge' and the 'public' typically emerges in everyday life as part of particular issues.

The debate over civil nuclear power is often presented by the nuclear industry and government agencies as a division between nuclear 'experts' and an emotional

public. Accordingly, public education is seen as the best way to win over support – if only people knew the facts then they would not worry unduly. However, this commitment to ‘educating’ the public is not just limited to the pro-nuclear lobby. Environmentalist groups also are keen to disseminate the ‘real facts’ about nuclear power. On each side, technical arguments are central to the debate. Meanwhile, the public are confronted with conflicting technical assessments of nuclear risk offered by groups who each claim a special understanding of the ‘facts’. In each case also, these technical assessments represent an important part of the attempt to win over public opinion to a particular stance on the nuclear issue.

A similar analysis can be made of the 1990 debate over what became christened ‘mad cow disease’ (but known in scientific discussions as BSE – Bovine Spongiform Encephalopathy). Here, we had statements from the British Department of Health and also from distinguished figures such as Professor Sir Richard Southwood informing the public that the risks of BSE were tiny. As Sir Richard argued, ‘we have more reason to be concerned about being struck by lightning than catching BSE from eating beef and other products from cattle.’<sup>1</sup>

Meanwhile, public concern was high – as indicated by the sudden drop in meat sales accompanied by a steep rise in media attention. Despite the official statements on BSE and the claims that scientific evidence suggested the risks to be small, two aspects of the public debate were very apparent. Firstly, that – as with the nuclear issue – scientific opinion was by no means unanimous (with Professor Richard Lacey, for example, taking a public stand against the ‘official’ position). Secondly, as the House of Commons Select Committee on Agriculture observed, ‘Scientists do not automatically command public trust.’<sup>2</sup>

This was to become a very familiar message with regard to BSE. Accordingly, whilst there was much criticism of the general public for their ‘emotive and irrational’ response to the risks of BSE, we also begin to see that there may be some more complex social relationships at work (for example, concerning the basis of trust in scientific expertise). Nevertheless, what seems unavoidably true is that scientific argument was central to the ‘mad cow’ debate – with public groups and individuals being obliged to respond to the technical debate either by acceptance or rejection. Going further, we can discern that various forms of scientific evidence were used to defend public stances on BSE. We also see in a case like this that personal decisions must be taken in the face of conflicting technical claims and apparent uncertainties. Quite clearly, therefore, scientific arguments play an important role in structuring (or ‘framing’) the conduct of public debate. Equally, we can suggest that science is itself framed by unstated social commitments.

This role of science in ‘framing’ public debate, and the implicit social framing of science itself, will be a major theme of the coming chapters. We will argue that science in this way offers a framework which is unavoidably *social* as well as technical

since in public domains scientific knowledge embodies implicit models or assumptions about the social world. In addition, as an intervention in public life, scientific knowledge involves rhetorical claims to the superiority of the scientific worldview but also it builds upon social processes of trust and credibility. Thus, whilst claiming to stand apart from the rest of society, science will reflect social interests and social assumptions.

Other examples of the ‘public understanding of science in action’ could readily be highlighted at this stage; debates over biotechnology and concerns over new reproductive technologies; advice on HIV/AIDS and ‘safe sex’; discussions over information technology and its impact on jobs, skills, and the quality of life; pollution and hazard issues; global environmental change; medical problems, childbirth, and contraception; food safety and occupational health. In all these – and many more – areas, some kind of interchange exists between scientific assessments and public actions and responses. This very pervasiveness of ‘expertise’ makes the ‘public understanding of science’ an important area for discussion and analysis even though it means that the debate also becomes very broad-ranging, ill-defined, and at times slippery. Equally, we should note that various sociological accounts of our current social structure – often described as late- or new-modernity – stress the centrality and pervasiveness of technical expertise.<sup>3</sup>

Even more importantly, in all these areas social as well as technical judgements must be made – the ‘facts’ cannot stand apart from wider social, economic, and moral questions even if rhetorically they are often put forward as if this were the case. We can readily gather on the basis of the discussion so far that the relationship between science and the public may not be so straightforward as suggested in the conventional treatment which assumes a clear boundary between ‘facts’ and ‘values’.

However, as has already been suggested, concern over the public understanding of science – either from the viewpoint of public groups or of scientists – is nothing new. Layton, for example, has shown how nineteenth-century concerns to advance public scientific literacy were imbued with an underlying anxiety to impart a particular worldview, one which would maintain social order and the legitimization of state institutions. Berg has analysed the Mechanics Institute movement in Britain (in the 1820s and 1830s) in similar terms.<sup>4</sup>

From another perspective, in the period around the Second World War the ‘visible college’ of left-wing scientists argued the need for a greater citizen awareness of science.<sup>5</sup> As J. B. S. Haldane put it in his 1939 book, *Science and Everyday Life*,

The ordinary man must know something about various branches of science, for the same reason that the astronomer, even if his eyes are fixed on higher things must know about boots. The reason is that these matters affect his everyday life.<sup>6</sup>

Here we see one blunt statement of the public need to understand science – even

if the 'higher things' pun also implies a notion of the inherent superiority of the scientific worldview over the shoemaker's craft (not an unusual nuance in scientific discussion of the 'ordinary person').

Writing immediately after the Second World War, the Association of Scientific Workers expressed similar sentiments in their programmatic *Science and the Nation*. Their argument for the scientific education of the public drew upon three of the most commonly stated justifications for an 'improved' public understanding:

- that a technically literate population is essential for future workforce requirements;
- that science is now an essential part of our cultural understanding;
- that greater public understanding of science is essential for a modern democracy . . .

If responsibility . . . rests ultimately on the citizen – as in a democracy it must – then the citizen must be aware of and evaluate the technical as well as social aspects of the problem. Democracy needs a greater technical awareness, a rise in the standards of social and technical thinking.<sup>7</sup>

We notice here that in all this debate 'science' itself is constructed as unproblematic – its epistemic commitments, social purposes, institutional structures, intellectual boundaries and relationship with 'non-science'. This treatment of science has certainly been carried forward into the modern debate over 'public understanding'. A further issue which is central to this book – but which is generally concealed within this debate – concerns the meaning of 'understanding'. Most often, this is seen to equal faithful assimilation of the available scientific knowledges including their framing assumptions and commitments.

In order to pursue their goal of greater public understanding of science, the Association of Scientific Workers made a number of recommendations concerning the 'broadening' of education through further education classes and such media as exhibitions and museums, film, the press, and radio. They also made a plea for working scientists to become more involved in public activities.

Although there were sporadic outbursts in-between, the debate over 'public understanding of science' re-emerged particularly strongly in 1985 with the publication of a Royal Society report on the subject – suggesting both the durability of these issues and the perceived absence of substantial progress. It was also in the 1980s that the UK Royal Society and the American Association for the Advancement of Science formed their respective Committees for the Public Understanding of Science, thus institutionalising the subject.

The Royal Society considered the significance of this issue in terms which are highly reminiscent of the Association of Scientific Workers – except for the absence of socialist rhetoric. The Royal Society report instead presents itself as concerned



with the general well-being of both science and society. However, the argument put forward by the Royal Society would surely have been endorsed by the Association of Scientific Workers:

A basic thesis of this report is that the better public understanding of science can be a major element in promoting national prosperity, in raising the quality of public and private decision-making and in enriching the life of the individual . . . Improving the public understanding of science is an investment in the future, not a luxury to be indulged in if and when resources allow.<sup>8</sup>

This theme has been more recently endorsed by the UK Government in its 1993 White Paper on Science Policy.<sup>9</sup>

Since the Royal Society report served as a stimulus to the work in this volume – and since accordingly it will be referred to directly in a number of chapters – it is worth discussing it here in a little detail.

The Royal Society cites a number of specific areas where an ‘improved understanding’ would be of personal and national value. In many ways, this list represents an elaboration of the justifications given earlier by the Association of Scientific Workers. The need for a wider public understanding is justified in terms of:

- national prosperity (for example, a better-trained workforce),
- economic performance (for example, beneficial effect on innovation),
- public policy (informing public decisions),
- personal decisions (for example, over diet, tobacco or vaccination),
- everyday life (for example, understanding what goes on around us),
- risk and uncertainty (for example, concerning nuclear power or BSE),
- contemporary thought and culture (science as a rich area of human inquiry and discovery).

In each of these areas, improved technical understanding would enrich society and improve the quality of decision-making.

Better overall understanding of science would, in our view, significantly improve the quality of public decision-making, *not* because the ‘right’ decisions would then be made, but because decisions made in the light of an adequate understanding of the issues are likely to be better than decisions made in the absence of such an understanding.<sup>10</sup>

This is, of course, a powerful argument which could be directly applied to the cases of BSE and nuclear power as previously discussed – a scientific understanding will illuminate the possibilities for action and allow a more considered response to everyday technical questions and problems. On this basis, the Royal Society advocated a series of changes within the education system, parliamentary bodies, the mass media, industry, and – especially – among scientists themselves in improving the current

situation. Interestingly also, the Royal Society envisaged a role for *social* science research in this area – particularly in terms of gauging the present level of public understanding (or ignorance) of science, assessing the effects of improved understanding, and discovering *from where* individuals currently obtain technical advice and information. In an indirect fashion, the chapters in this collection represent a response to this demand for social scientific analysis. However, as we will now consider, the perspective adopted in this book diverges sharply from that of the Royal Society.

In particular, we can see certain assumptions embedded in the approaches to ‘public understanding of science’ considered so far – both as demonstrated by general accounts (such as that provided by the Royal Society) and also within contemporary controversies (for example, over BSE). First of all, there is an apparent assumption of ‘public ignorance’ in matters of science and technology – an assumption which has been bolstered by recent questionnaire surveys. According to these, the general public often lacks a basic understanding of scientific facts, theories and methodologies. Public controversy over technical issues is created by inadequate public understandings rather than the operation of science itself. This projection of a ‘public ignorance’ model also serves to problematise the general public rather than the operation of scientists and scientific institutions – just why aren’t the public more responsive?

Secondly, there is an assumption that science is an important force for human improvement and that it offers a uniquely privileged view of the everyday world. Thus, the Nobel prize-winner Max Perutz approvingly quotes Nehru in his combatively entitled book, *Is Science Necessary?*:

It is science alone that can solve the problems of hunger and poverty, of insanity and illiteracy, of superstition and deadening custom and tradition, of vast resources running to waste, of a rich country inhabited by starving people . . . Who indeed could afford to ignore science today? At every turn we have to seek its aid . . . The future belongs to science and those who make friends with science.<sup>11</sup>

Finally, science is portrayed in these accounts as if it were a value-free and neutral activity. Science *illuminates* and *assists* – it does not constrict or legitimate. Equally, the conditions under which scientific knowledges are constructed and validated are not challenged by the Royal Society. Science is unproblematically ‘scientific’ – it represents the *only* valid way of apprehending nature.

These points are, of course, important at a time when science is actually under criticism from a number of directions, and is generally suffering a marked lack of public support when it tries to rally a defence against outside attacks. Thus, whilst from the perspective presented so far science is the potential saviour of society, more critical voices have portrayed science as a major *cause* of ecological damage, military threats, constraints on personal liberty, and social disruption. In that sense also, it

can be argued that the 'public understanding of science' represents an attempt by scientific institutions to regain their social standing and status in the face of public criticisms. As one of us has previously argued:

the re-emergence of the public understanding of science issue in the mid-1980s can be seen as part of the scientific establishment's anxious response to a legitimisation vacuum which threatened the well-being and social standing of science.<sup>12</sup>

This 'institutional neurosis' of science over public identification and legitimisation is not by any means a new phenomenon. On the contrary, it appears to be a chronic condition throughout the history of science – albeit at a varying level of anxiety. The recent re-emergence of the issue thus calls for a deeper reflection than has so far taken place.

The chapters in this book seek to move the analysis of 'public understanding of science' away from the prevailing science-centred framework as sketched so far (and also from a simple oppositional or 'anti-science' stance). Instead of assuming that the problem is only or mainly with the public, we examine *both* the operation of scientific expertises/institutions and different 'publics' in relation to one another. This *relational* focus is especially important within the following accounts. In doing so, we interpret both 'science' and the 'general public' as diverse, shifting and often-diverging categories. We also adopt a critical-reflective stance on the current debates over public understanding of science in order to consider their motivation and underlying concerns. The general argument in this book is that we need to rethink and reconceptualise the relationships between 'science' and the 'public' if we are to make progress at the level either of understanding or practical intervention.

This process of rethinking the public understanding of science should begin with our notion of *science*. Contrary to the kinds of division and contradiction which are found in such cases as civil nuclear power and BSE, the image of science which is generally presented within the 'public understanding of science' is of a unified, cleanly bounded, and clear body of knowledge and method. We also need to consider the nature not only of 'scientific institutions' (i.e. those bodies directly concerned with the funding, management, and implementation of science and technology), but also of the much larger category of institutions within society which draw upon or exploit science as a source of defence, legitimisation or profit (for example, to return to the examples at the start of this chapter, the nuclear and food industries and the related government departments).

In this book, we will draw upon the last two decades of research within the sociology of scientific knowledge which has convincingly demonstrated the *socially negotiated* nature of science.<sup>13</sup> This resource is needed in order to examine the *varying* (i.e. heterogeneous) constructions and representations of science and to consider the relationship between these representations and the social institutions which employ

scientific discourses and arguments. Thus, science will not be represented as a simple 'body of facts' or as a given 'method', but as a much more diffuse collection of institutions, areas of specialised knowledge and theoretical interpretations whose forms and boundaries are open to negotiation with other social institutions and forms of knowledge.

It will, therefore, be apparent in what follows that we are not counter-posing a homogeneous body of 'science' against a more diverse array of 'public understandings'. Instead, we portray both 'public' and 'scientific' knowledges as building upon wider commitments and assumptions. Implicit in our collection is that only a properly sociological approach to contemporary science can give us a real insight into the issues of 'public understanding'. Otherwise, we are doomed to a sterile and even counter-productive juxtaposition of 'science' against 'non-science' rather than an appreciation of the diversity and social interdependence of different forms of science, knowledge and expertise.

Of particular relevance within this book will be the manner in which scientific boundaries are established and maintained, i.e. the way in which 'science' is separated from 'non-science' or 'everyday knowledge'. By analysing contemporary science from this perspective, we can consider the different faces which science presents to the wider public. A key part of this is how 'constructions of society' (for example, tacit assumptions about users or audiences) are embedded within, and shape, scientific constructs. We can also examine how assumptions are made or decisions taken about *which* aspects of science to highlight to particular audiences. Going further, we can consider how different social groups recruit scientific arguments in order to support their case (a process which is quite evident in cases such as nuclear energy or mad cow disease). We can also consider how what counts as 'science' may be shaped by social relations and institutional structures so that the very constitution of science will reflect wider social interests.

Put simply, the research in this collection will move beyond a mere problematisation of *the public*. Instead, we will consider the operation of science in everyday situations – and, in particular, the different forms and representations of science which confront public groups. This point will be important in terms of the analysis which follows. It will also lead us to consider not just the 'public understanding of science' but also the scientific understanding of the public and the manner in which that latter understanding might be enhanced. We assert that this perspective is essential to the expressed goal of improving public uptake and 'understanding' of science, since without such a reflexive dimension scientific approaches to the 'public understanding' issue will only encourage public ambivalence or even alienation.

Rather than assuming from the beginning of discussion, therefore, that science unconditionally deserves privileged status, we need to consider just how relevant and important scientific understanding is within everyday life. To accept science as

a key resource in public issues is radically different from accepting its automatic authority in *framing* what the issues are. Scientific approaches typically confuse these fundamentally different dimensions. This requires a problematising of what is actually meant by 'scientific understanding' in various contexts. We will also – especially in the concluding chapter – look again at the consequences of our new approach for the organisation of science.

This critical treatment of science will be matched in the following accounts by an awareness of the diversity of *public groups*. As we have already suggested, scientific statements about 'public understanding' tend to draw upon some notion of the typical citizen (i.e. Haldane's 'ordinary man'). Very little justification is given for this portrayal – instead, the public is portrayed as a homogeneous mass which needs to be rendered more receptive to the insights of science. The 'public' exist as an audience for science; they are an object rather than a subject. At this stage, we need to remember Raymond Williams' observation: 'there are in fact no masses, but only ways of seeing people as masses'.<sup>14</sup>

Rather than simply adopting this 'top-down' and dissemination-oriented model, much of the research in this book takes a very sensitive and careful look at the publics for science and considers their needs and interpretations. It also, crucially, is alive to the ways in which scientific knowledge frequently embodies tacit commitments about audiences or user-situations which may then serve as unnegotiated social prescriptions. Several of the chapters also examine non-scientific forms of knowledge and expertise (for example, those generated by direct and practical experience of scientific or technological systems) and their relationship to formalised understandings.

Viewed from this perspective, important issues of trust and credibility arise – why should we believe something just because it claims to be scientific? What kind of social relationship or identity is being tacitly proposed, or imposed, within scientific communications?

We also need to consider the ways in which personal understandings of the world (and previous experiences) fit together with scientific accounts – 'making sense' of new information is revealed to be a complex process which is likely to draw upon a series of sources. We see, too, that, specific publics are likely to be sceptical, critical or simply hostile to scientific statements – often because such statements seem to emerge from an idealised and inappropriate model of real world conditions. We may also find a resistance to the perceived social interests which are embedded in scientific statements – as when science is used for the legitimisation of industrial practices (for example, the continued operation of hazardous industries). Taken together, we will replace the notion of 'public ignorance' with a much richer pattern of social relations and personal understandings.

In seeking to reconsider both 'science' and 'the public', we must also examine

the kinds of *mediating institution* which currently convey scientific argumentation to the general public. What kinds of institution are these and how do they select the forms of technical appraisal for dissemination? These ‘mediating institutions’ take a number of forms – environmental groups, local industry, the mass media, the organisers of science exhibitions, government officials, doctors – but they offer important routes to the public’s experience and understanding of science. What issues arise from the operation of these groups which deserve attention here? We must ask also whether these institutions stand apart from the conventional model of science–public relations or whether they can offer new, and perhaps more effective, patterns of cultural and knowledge relations.

Finally, each of the chapters has implications for *practical interventions* in this area. In the concluding chapter, we will address this theme directly – what are the policy implications of the new approach to ‘public understanding’ which has been developed in this collection?

Why then choose such an apparently cryptic title for this book? Of course, *Misunderstanding science?* runs the risk of reinforcing the very notion that we have already tried so hard to dispel, i.e. that the problem is one of the public ‘misunderstanding’ science (what we can call the ‘deficit’ model as discussed, for example, in Chapters Two and Five). However, our title also suggests the opposite – that it is *science* which misunderstands both the public and itself. Given that most discussion in this area has stressed the former kind of misunderstanding, our collection will give particular attention to the latter.

Our sub-title reinforces this emphasis by suggesting the active processes through which people ‘reconstruct’ technical information within everyday life. We will, therefore, be particularly concerned with the different ‘senses’ which science presents and also with the way in which the ‘cloth of meaning’ (see Chapter Three) is woven and rewoven. For the contributors to this book, the ‘reconstruction’ of science within everyday life is an active and often-demanding process. As we will see, public groups often show great resourcefulness in carrying out this essential task – a resourcefulness which frequently makes scientific messages appear simplistic and one-dimensional.

### Book structure

As has already been suggested, the chapters in this book are designed not to document nor explain the ‘public misunderstanding of science’, but to explore the specific contexts within which different kinds of technical judgement are reached by ‘lay’ publics. Put differently, we need to examine how different publics succeed or otherwise in ‘re-constructing’ science as part of their own agendas. In tackling this, we will observe the limitations of scientific information in terms of everyday decisions

and consider the role of social and political judgement in making practical use of science.

As we have argued so far, this citizen-oriented perspective offers considerably richer insights into the role of science within everyday life than the simplistic and technocratic assertion that 'more science must be better'. However, such a perspective requires considerable sensitivity to the knowledges and understandings possessed by citizens within specific situations and contexts. In order to develop this perspective, the various authors within this book have adopted a detailed, context-specific and local analysis of 'public understanding' rather than large-scale surveys or sweeping generalisations. However, a series of common analytical questions recur throughout these case-studies;

- what do people mean by 'science' and 'scientific expertise'?
- where do they turn for technical information and advice?
- what motivates them to do so?
- how do they select from, evaluate and use scientific information?
- how do they relate this expert advice to everyday experience and other forms of knowledge? What is involved in its integration at this level?

These questions will run through a series of detailed investigations – covering such areas as scientific researchers and policy-makers, medical patients and their families, communities around hazardous industrial sites, environmentalist groups, Cumbrian hill farmers coping with radioactive fall-out, museum staff, and visitors.

It should also be explained that these studies all began as part of one Economic and Social Research Council (ESRC) and Science Policy Support Group (SPSG) programme within the 'public understanding of science' (not least so that we can gratefully acknowledge the assistance and support provided especially by the SPSG). Thus, whilst the case-studies and research questions may vary from chapter to chapter, they do share a framework of analysis and understanding which has developed over a considerable period of time.

In stating this, we are aware that this range of study areas, and the very diffuseness of the 'public understanding of science' as an area of research and practice, may stretch the task of synthesis to the very limit. It would be quite wrong for us to pretend that all of these chapters fit neatly into a logical and coherent ordering. Whilst – as we have already argued – there is considerable thematic and analytical overlap in what follows, there is also a diversity of perspective and focus – not least because of the diversity of contributors to this book (see the 'Notes on contributors').

The area of analysis presented in this book contains a fresh approach and a new way of thinking about the sciences and their publics. It is only right, therefore, that there will be differences of emphasis and argument in what follows. We do not wish to conceal these or to consider their existence as an intellectual (or editorial)

weakness – instead, *Misunderstanding science?* includes a range of contributors who, whilst agreeing on the broad framework of analysis, span a range of social scientific perspectives. We intend to offer in this collection both a fresh line of analysis and also a diversity of specific analyses. Furthermore, we feel it necessary to grasp something of the different social contexts within which the science–public relationship is encountered and negotiated.

Specific chapters within this collection focus on the nature of interactions between scientific representations and public responses. Others attempt to illustrate the constructed, contextual nature of scientific accounts. The final chapters look to the changing framework for science–public relations.

The first chapters present a strong set of ‘contexts’ for the public understanding of science. Brian Wynne presents an evocative example of one area of science–public interactions; the case of Cumbrian sheep–farmers in the wake of the Chernobyl disaster. Wynne analyses the relationship between the understandings and expertises held by the sheep–farmers and those of the official bodies who were attempting to control the sale and movement of radiation–contaminated sheep. Wynne raises questions of the construction and application of scientific knowledges in this specific context. He also discusses the robust views of local people when confronted with this kind of ‘laboratory science’. The main points of this case–study are to elucidate the complex factors affecting the public credibility and uptake of scientific knowledge, and to highlight science as a culture involving its own pre–commitments and prescriptions beneath specific claims and ‘facts’. Wynne argues that this is a general condition and that public responses originate at this level as well as that of specific claims.

The following chapter develops some similar arguments in a very different social context; the case of local communities living with the routine risk and pollution from the chemical industry. Even in this less coherent and less tightly defined social setting, Irwin, Dale, and Smith discover a critical public response to technical advice and information. Once again, and very importantly for this collection, science ‘disappears’ into the everyday life of this community – on the face of it, the official communications and public reactions have little or nothing to do with science, nor indeed does science figure as a part of everyday discussion about local hazards. However, as the authors argue, implicit models of technical expertise are employed to legitimate industrial assessments of risk. Such expertise is then met with a questioning and often sceptical local audience.

This ‘disappearance’ of science within specific contexts of action and understanding is a recurrent theme of *Misunderstanding science?* From the perspective of influential scientific institutions such as the Royal Society, science should be centre–stage within important areas of everyday life such as issues of risk and pollution. Certainly, science is drawn upon by industrial and government organisations as a source of rhetorical and ideological support for particular social practices – for example, in